

1 **Amendment to the Claims**

2 **In the Claims:**

3 Please amend Claims 27, 39, 43, 46, and 57 and add new Claims 64-65 as follows:

4 1. – 26. (Canceled)

5 27. (Currently Amended) A device comprising:

6 an impaction plate,

7 a planar collection surface on the impaction plate,

8 a spotting nozzle for directing an air stream towards the collection surface, ~~whereby~~
9 ~~impact of the air stream passing through the spotting nozzle before impacting on the surface forms to~~
10 form a spot of airborne particles on the collection surface,

11 an analyzer configured to analyze the particles while the particles are retained on the
12 collection surface and the impaction plate remains in the device,

13 a surface regenerator for regenerating the collection surface such that particles
14 collected before regenerating the collection surface are removed from the collection surface, and thus
15 are substantially no longer present to contaminate a spot of particles collected after regenerating the
16 collection surface, and

17 a homing sensor, wherein the homing sensor is a mechanical structure configured to
18 cyclically and automatically move the collection surface relative to the nozzle, the analyzer, and the
19 surface regenerator, movement of the collection surface being controlled such that in each successive
20 cycle a first portion of the collection surface will initially be adjacent to the nozzle, then adjacent to
21 the analyzer, then adjacent to the surface regenerator, and then adjacent to the nozzle once again in a
22 subsequent cycle.

23 28. (Original) The device according to claim 27 wherein the collection surface is smooth.

24 29. (Original) The device according to claim 27 wherein the spot is enriched in particles of
25 1-10 µm size range.

26 30. (Original) The device according to claim 27 wherein the analyzer is a fluorescence
27 detector.

28 31. (Original) The device according to claim 27 wherein the analyzer is an infrared
29 absorbance detector.

30 32. (Original) The device according to claim 27 wherein the analyzer is a mass spectrometer.

1 33. (Original) The device according to claim 27 wherein the analyzer is a surface enhanced
2 Raman spectrometer.

3 34. (Original) The device according to claim 27 wherein the surface regenerator is a felt
4 wheel.

5 35. (Original) The device according to claim 27 wherein the impaction plate comprises a
6 plurality of collection surfaces.

7 36. (Original) The device according to claim 27 further comprising at least one particle
8 concentrator upstream of the nozzle.

9 37. (Original) The device according to claim 27 further comprising a size selective inlet
10 upstream of the nozzle.

11 38. (Original) The device according to claim 27 wherein the impaction plate is a lobed cam
12 having a shaft, the impaction plate comprises at least one planar collection surface substantially
13 parallel to the shaft, and the homing sensor comprises the shaft.

14 39. (Currently Amended) A device comprising:
15 an impaction plate,
16 a planar collection surface on the impaction plate, said planar collection surface being
17 incorporated into the device,

18 a spotting nozzle for directing an air stream towards the collection surface, whereby
19 impact of the air stream on the surface forms a spot of airborne particles on the collection surface,
20 means for analyzing the particles while the particles are retained on the collection
21 surface and without removing the collection surface from the device,

22 means for regenerating the collection surface without removing the collection surface
23 from the device such that particles collected before regenerating the collection surface are removed
24 from the collection surface, and thus are substantially no longer present to contaminate a spot of
25 particles collected after regenerating the collection surface, and

26 means for translocating the collection surface relative to the nozzle, the analyzer, and
27 the surface regenerator.

28 40. (Previously Presented) The device according to claim 39 wherein the means of analyzing
29 the spot is selected from the group consisting of means for measuring biological, chemical, and
30 radiological properties.

1 41. (Original) The device according to claim 39 wherein the means of analyzing the spot is a
2 fluorescence detector.

3 42. (Original) The device according to claim 39 wherein the means for regenerating the
4 collection surface comprises a felt pad.

5 43. (Currently Amended) The device according to claim 39 wherein the means for
6 translocating the collection surface comprises a shaft attached to the impaction plate, wherein rotation
7 of the shaft by a prime mover incorporated into the device at predetermined angles operatively
8 positions the collection surface to the spotting nozzle, the means for analyzing the spot, and the
9 means for regenerating the collection surface.

10 44. (Original) The device according to claim 39 further comprising at least one particle
11 concentrator upstream of the nozzle.

12 45. (Original) The device according to claim 39 further comprising a size selective inlet
13 upstream of the nozzle.

14 46. (Currently Amended) The device according to claim 39 wherein the impaction plate is a
15 lobed cam having a shaft, the impaction plate comprises at least one planar collection surface
16 substantially parallel to the shaft, and the means of translocating comprises the shaft and a prime
17 mover incorporated into the device.

18 47. – 56. (Canceled)

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1 57. (Currently Amended) A device comprising:
2 an impaction plate,
3 a planar collection surface on the impaction plate,
4 a nozzle for directing an air stream towards the collection surface, whereby impact of
5 the air stream on the surface forms a spot of airborne particles on the collection surface,
6 a pre-analysis spot preparation station,
7 an analyzer for examining the particles while the particles are retained on the
8 collection surface and the impaction plate and collection surface remain in the device,
9 a surface regenerator capable of removing the deposit from the surface after analysis
10 such that particles collected before regenerating the collection surface are removed from the
11 collection surface, and thus are substantially no longer present to contaminate a spot of particles
12 collected after regenerating the collection surface, and
13 a homing sensor, wherein the homing sensor is configured to automatically and
14 operatively position the collection surface relative to the nozzle, the analyzer, and the surface
15 regenerator, the homing sensor comprising a prime mover configured to provide a motive force to
16 operatively position the collection surface relative to the nozzle, the analyzer, and the surface
17 regenerator.

18 58. (Original) The device according to claim 57 wherein the surface comprises pyramid-
19 shaped structures of about 1-10 μm in height and width.

20 59. (Original) The device according to claim 57 wherein the surface regenerator comprises a
21 regenerator nozzle for blowing air towards the collection surface.

22 60. (Original) The device according to claim 57 wherein the impaction plate is a lobed cam
23 having a shaft, the impaction plate comprises at least one planar collection surface substantially
24 parallel to the shaft, and the homing sensor comprises the shaft.

25 61. (Original) The device according to claim 57 further comprising at least one particle
26 concentrator upstream of the nozzle.

27 62. (Original) The device according to claim 57 further comprising a size selective inlet
28 upstream of the nozzle.

29 63. (Canceled)

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1 64. (New) An air sensor device configured to collect airborne particles and to evaluate
2 collected airborne particles in order to determine if the collected airborne particles indicate the
3 presence of a biological threat, comprising:

4 (a) a regenerable solid collection surface for supporting a spot of immobilized
5 airborne particles, the regenerable solid collection surface being specifically configured to remove
6 particles from an air stream by impaction of the air stream against the regenerable solid collection
7 surface;

8 (b) means for regenerating the regenerable solid collection surface by removing
9 particles from the regenerable solid collection surface without removing the regenerable solid
10 collection surface from the air sensor device, such that once regenerated, the regenerable collection
11 solid surface can collect additional particles from the air, such that particles collected before
12 regenerating the regenerable solid collection surface are substantially no longer present to
13 contaminate particles collected after regeneration; and

14 (c) means for analyzing the spot of immobilized airborne particles while the
15 particles remain disposed on the regenerable solid collection surface without removing the
16 regenerable solid collection surface from the air sensor device, to determine if the spot of
17 immobilized airborne particles represents a biological threat.

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1 65. (New) A method of detecting airborne biological particles, the method comprising:

2 (a) depositing airborne particles on a regenerable solid collection surface provided
3 for supporting a spot of immobilized airborne particles, such that the particles deposited on the
4 regenerable solid collection surface form a spot, said regenerable solid collection surface being
5 incorporated into an air sensor;

6 (b) measuring a biological signature present in the particles comprising the spot,
7 using a detector incorporated into the air sensor, the detector being configured for sensing the
8 biological signature of the particles, while the particles remain deposited on the regenerable solid
9 collection surface without removing said regenerable solid collection surface from the air sensor;

10 (c) determining a concentration of the immobilized airborne biological particles
11 from the measurement of the biological signature in order to determine if the biological particles
12 should be considered to represent a potential biological threat; and

13 (d) regenerating the regenerable solid collection surface by removing particles
14 from the regenerable solid collection surface, without removing said regenerable solid collection
15 surface from the air sensor, such that once thus regenerated, the regenerable solid collection surface
16 can collect additional particles from the air, and such that particles collected before regeneration of
17 the regenerable surface are substantially no longer present to contaminate particles collected after the
18 regeneration.